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Magnetically responsive calcium carbonate microcrystals

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Abstract

Here we report the fabrication of magnetically responsive calcium carbonate microcrystals produced by coprecipitation of calcium carbonate in the presence of citrate-stabilized iron oxide nanoparticles. We demonstrate that the calcite microcrystals obtained possess superparamagnetic properties due to incorporated magnetite nanoparticles and can be manipulated by an external magnetic field. The microcrystals doped with magnetic nanoparticles were utilized as templates for the fabrication of hollow polyelectrolyte microcapsules, which retain the magnetic properties of the sacrificial cores and might be spatially manipulated using a permanent magnet, thus providing the magnetic-field-facilitated delivery and separation of materials templated on magnetically responsive calcite microcrystals.

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Keywords

calcium carbonate, hollow microcapsules, magnetic nanoparticles, polyelectrolytes